

# **2008 Federal Environmental Symposium**

## **Environmental Awareness & Outreach at Sandia National Laboratories**



**June 19, 2008**  
**Katrina Wagner**  
**Outreach Coordinator**

# Outreach Presentation Outline

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1. **Introduction – Sandia’s EMS & LTES Programs**
2. **Why does Sandia need environmental outreach?**
3. **Who is our audience?**
4. **What do we communicate?**
5. **How do we communicate?**
6. **Outreach Challenges**
7. **Outreach Success Story**
8. **Questions and Feedback**



# Sandia's EMS & LTES Programs

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- Sandia's Environmental Management System (EMS) is a continuing cycle of planning, evaluating, implementing, and improving processes and actions undertaken to achieve environmental goals.
- Sandia's Long-term Environmental Stewardship (LTES) Program involves stewardship activities for past, present, and future activities.
- Outreach is a vital component of our EMS & LTES programs because....



In the top left corner, there are three stylized stars in white, red, and blue, arranged in a diagonal pattern.

# Why does Sandia need Environmental Outreach?

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- To help members of our workforce reduce environmental impacts at work and at home;
- To communicate with the workforce and the public about Sandia's commitment to environmental stewardship;
- To receive feedback from the workforce and the public about environmental concerns.
- Outreach is a requirement!

# Who is our audience?

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- **Members of Sandia's Workforce**
- **Sandia Management**
- **The Public**
- **Students**

Information booth at an EMS event at Sandia

# What do we communicate?

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- **Environmental Awareness at home and at work**
- **How we protect the environment at Sandia**
- **Sandia's environmental accomplishments**
- **Workforce accomplishments**
- **How to minimize environmental impacts**

# How do we communicate?

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- **Newsletters**
- **Lecture Series**
- **EMS Excellence Awards**
- **Fact Sheets**
- **Internal and External Websites**
- **National Atomic Museum Video and display**
- **Public Meetings**
- **Youth Education (Youth Conference & Education models)**
- **Internal Publications (Cafeteria Events, SDN, Porcelain Press, LabNews)**



# Newsletters



## Photovoltaic Alternatives at Sandia

by Morgan Gensel

A few years ago, it took an observant eye to notice a photovoltaic (PV) application at Sandia National Laboratories, New Mexico (SNL/NM) aside from the National Solar Thermal Test Facility. Now, PV can be seen in several parking lots across the site. A keen eye may even detect its use along walkways, corridors, and on some rooftops. In many cases, though, PV at Sandia New Mexico remains well hidden or disguised.

The Facilities Energy Management Program, one of SNL/NM's 17 environmental programs under the Environmental Management System (EMS), identifies and implements new PV projects and installations annually. At the moment, PV powered lights are being used at the parking lots of Building 800, the Credit Union, and on F Avenue (Bldg. 848). Also, PV now powers walkway lights near MC308, the walkway south of the T-Bird Café (Bldg. 861), and in the shade structure at the Innovation Corridor near Buildings 898 and 897.

In addition to PV used for parking lot illumination, Building 833 has taken it to a new level. Out of view, on top of Building 833, PV has been incorporated into the membrane of the roof. Obviously, this is not your typical rigid PV panel but a cutting edge, flexible type that can be integrated into the roof. This new flexible PV system is called Building Integrated PV or BIPV. Surrounding Building 833 is a small PV farm used for research by the Distributed Energy Test Laboratory (DETL). The DETL team recently won an EMS Excellence Award for connecting both the Building 833 BIPV and its PV farm into the Sandia grid. The

energy generated by these sources can power between 20 and 30 average homes in Albuquerque for a year.

At the moment, the Facilities Energy Management Program is funding a unique project called hybrid lighting. In Building 887, natural light will reach areas of little or no daylight. A solar collector on the roof will direct light through fiber optics to reach these areas that require lighting. This new technology can reduce the need for electric lights by 80%. If this technology is well received it has the potential of being added to many more buildings at SNL/NM.

Although PV is in its infancy as an SNL/NM energy source, the near future growth at SNL/NM may be substantial. Much bigger PV projects are on the horizon and drawing board:

- PV shade structure in the parking lot north of 887, 1 Megawatt, enough to power over 300 average homes in Albuquerque.
- BIPV for Building 956 roof, 50 kilowatts, enough to power over 15 average homes in Albuquerque.
- PV stations for electric carts.
- PV for more external lights in areas such as parking lots, and

- PV farm to generate energy to power SNL/NM.

Facilities Energy Management and other sustainable groups at SNL/NM are beginning to take full advantage of Albuquerque's geographic location and plentiful sun. Increasing energy costs and the competitive PV market are also helping this effort. Facilities Energy Management Team hopes that Sandia will one day "power itself entirely through renewable sources."



Left to Right: Examples of PV applications throughout SNL



## Long-term Environmental Stewardship Sandia National Laboratories Fall 2007 Newsletter

The newsletter is distributed to the community to provide the latest information on Long Term Environmental Stewardship (LTES) Long Term Stewardship (LTS) environmental activities at Sandia.



Cholla Tree at Sandia

The LTES Program is responsible for providing a corporate wide process for minimizing adverse environmental impacts from Sandia National Laboratories' (SNL) operations, including new, active and legacy sites.

The LTES mission ensures long-term protection of human health and the environment and proactive management toward sustainable use and protection of natural and cultural resources affected by Sandia's operation and operational legacies.

The LTES Program is continuing to grow and improve our ability to better represent concerned citizens. We have created a new website that offers user-friendly access to information on events and projects within the LTES Program. The public can also access fact sheets relating to Sandia's environmental programs, as well as information on the Community Checklist.

For more information on Sandia's LTES Program, please visit our new website at : <http://ltes.sandia.gov>



Hawthorn in the foothills

**Environmental Management System  
Newsletter – published quarterly;  
distributed to members of the  
workforce; available to the public.**

**Long-term Environmental Stewardship  
Newsletter – published semi-  
annually; distributed to 500  
stakeholders.**



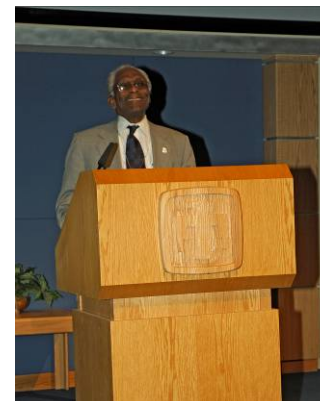
# EMS Events - Lecture Series



**Dr. Mario Molina, Nobel Prize Laureate, addressed Sandia at our Earth Day celebration in April 2006.**



**Sandra Postel, Director of the Global Water Project, addressed Sandia at an EMS Event in July 2006.**



**Dr. Noel Brown, President of Friends of the United Nations, discussed world food supply at Sandia in October 2006.**



**The late Dr. Paul MacCready, inventor of the human powered aircraft, addressed Sandia for our Earth Day Celebration in April 2007**

# EMS Events – YOU'RE INVITED!

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# EMS Events – Information Booths

**Sandia invites internal organizations, private organizations and city and state government entities to participate with information booths at our events. We often have giveaways to give attendees!**



**South Valley Grower's Association providing an information booth about the benefits of locally grown produce at an EMS Event.**



# EMS Excellence Awards



EMS Awards recognize exemplary environmental advancements made by members of Sandia's workforce in the following categories:

1. Energy Reduction/Water Conservation
2. Risk Mitigation Environmental Protection
3. Environmentally Preferable Purchasing
4. Waste Minimization
5. Recycling

Since 2006, we have received **86** nominations!



Award recipients at the EMS Awards Ceremony



# Fact Sheets

## Water Conservation

**WHY CONSERVE WATER?**  
Water is a precious resource critical to the economic health of the city, state and continued operations at Sandia National Laboratories/New Mexico (SNL/NM).

**Water Conservation Program**  
A memorandum of understanding (MOU) requires SNL/NM to continually reduce water use to mitigate its impact on the aquifer.

This MOU drives the water conservation program and exists between SNL/NM and the


- Department of Energy
- Kirtland Air Force Base
- City of Albuquerque
- State of New Mexico
- National Research Energy Laboratory

**Goal**  
The goal of the water conservation program is to reduce our water use by 30% based on a 1995 estimated use.

**How do we monitor our use?**  
SNL/NM uses water meters to monitor water use. A central computer communicates with the meters and records data minute-by-minute.

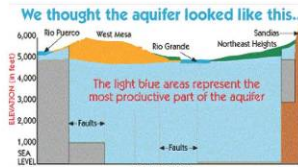
Water meters are installed:

- On all the main lines feeding SNL areas
- On the major buildings in Technical Area IV

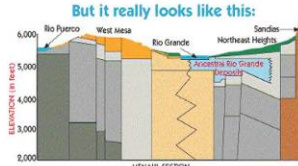


In the future, meters will be installed in Technical Area I and II.

**We thought the aquifer looked like this...**




**But it really looks like this:**





**Water Conservation Projects**  
Highlights of some projects are listed below. The estimated water savings are shown in million gallons per year (MGY).

**Building 858 & MESA**  
Increased reverse osmosis efficiency: 35 MGY  
Other planned efficiencies in the MESA project will save an additional 60 MGY



**Projects at Other Locations**  
Steam plant: repaired leaks, replaced deaerator, began caustic addition to boilers: 20 MGY CSRL, Building 893: replaced once-through cooling system for lasers with closed loop: 10 MGY



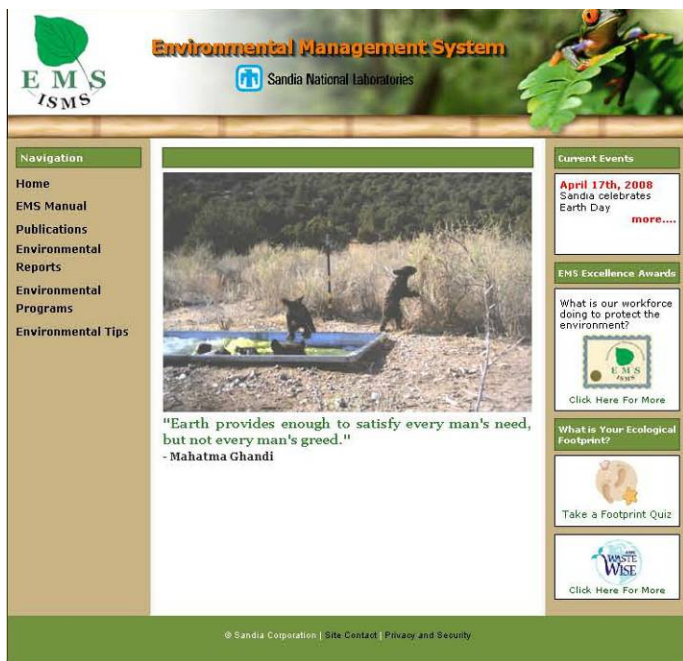
Printed on 100% recycled content paper. 

For additional EMS information, please visit: <http://EMS.sandia.gov>

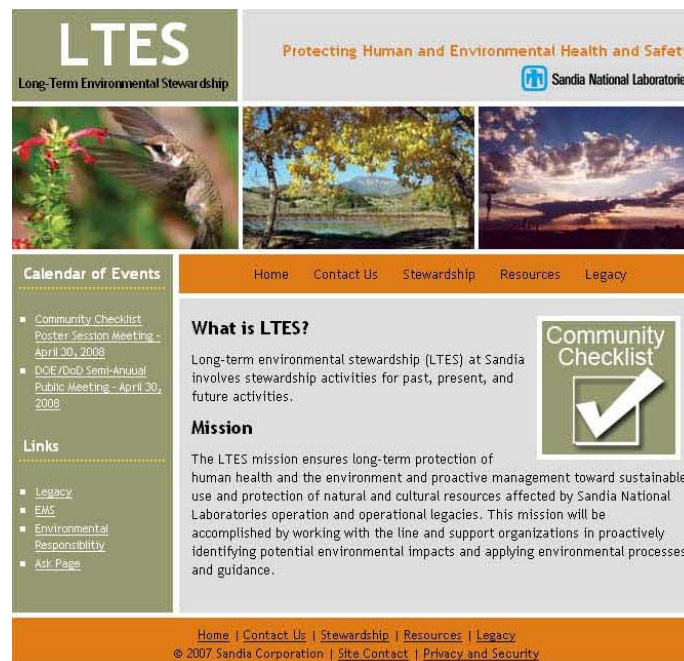
**Fact Sheets provide helpful environmental tips and facts. They are posted on our websites and are distributed at all environmental events.**

**Sandia's fact sheets include: Water Conservation, Energy Use, Recycling, and Natural Resources.**

# Websites



environment.sandia.gov



ltes.sandia.gov




# Websites continued

**sustainability at sandia national laboratories**

"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."  
Brundtland Commission

The path to environmentally sustainable operations at Sandia includes achieving 100% recycling of all recyclable commodities; applying resource productivity principles to broadly institute procurement of sustainable products; using green chemistry principles to significantly reduce chemical purchases, waste generation and environmental releases; significantly reducing the use/waste of potable water where alternatives exist, and incorporating sustainability thinking into process and project design practice.



The information on this site is designed to inform Sandia's workforce and help make Sandia a sustainable workplace.

- Green Buildings at Sandia
- Energy Management
- Water Conservation
- Environmental Management System
- Pollution Prevention
- Transportation
- Long Range Development Plan
- Ten Year Site Plan
- Sustainability Research
  - Wind
  - PV
  - Security in Energy
  - Materials

Last Updated: 02/04/2008 17:40:30  
Web Developers: [ES&H](#) [JMT](#) [TEHR](#)  
Content: [Katrina Wagner](#)

**Sustainability Portal website – in production now!**

**Green Buildings website – highlighting Sandia's numerous LEED certified buildings!**

**green buildings at sandia**

**Leading New Mexico with three Leadership in Energy and Environmental Design (LEED) Certified Buildings**

What is Sustainable Design?

Aspects of SD (landscape, fixtures, materials)

What Makes a Building Green? (use sketches)

History of SD at Sandia (timeline)

In the Pipeline

Existing Buildings

New Construction

Awards

LEED Checklist - specs

SD Report - not ready yet

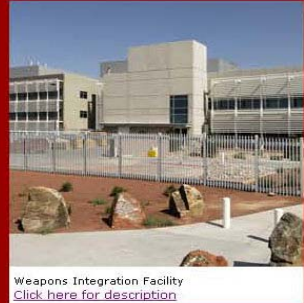
USGBC

Drivers

<<back to GREEN BUILDINGS HOME  
<<back to SUSTAINABILITY PORTAL

Sustainable Design is an integrated approach that considers the entire life of a building from construction to demolition. The goals of sustainable design are to avoid depletion of resources including energy, water, and raw materials and prevent environmental damage caused by buildings and facilities throughout their life, and create building environments that are livable, healthy, and productive.

This website is intended to highlight Sandia's SD accomplishments and serve as a tool for Project Managers.



Weapons Integration Facility  
[Click here for description](#)

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Web Developers: [ES&H](#) [JMT](#) [TEHR](#)  
Content: [Katrina Wagner](#)

# National Atomic Museum Kiosk

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- Videos for the public about Long-term Environmental Stewardship at Sandia
- LTES Display
- Newsletters



# Public Meetings

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- **The Department of Energy and the Department of Defense hold semi-annual public meetings to discuss current status of Environmental programs and activities at Sandia National Laboratories and Kirtland Air Force Base.**
- **Goal: communicate with the public and receive feedback.**



# Public Meetings continued

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## Community Checklist

- Members of Sandia's workforce met with community members who have an interest in LTES at Sandia in May 2007 to create the Community Checklist and in April 2008 to review the checklist.
- The Community Checklist lists the community members' questions about LTES at Sandia. Subject matter experts addressed the questions and posted the answers to our LTES website.



# Youth Education

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- **Teacher Curriculum**
- **Teacher Open House**
- **Education Models**
- **Annual Youth Conference on the Environment**



Student participating in Youth Conference



# Annual Youth Conference on the Environment

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- **11<sup>th</sup> Annual Conference**  
**held in April this year**
- **One day, FREE conference**  
**for high school students**
- **Hands-on learning of**  
**environmental issues**





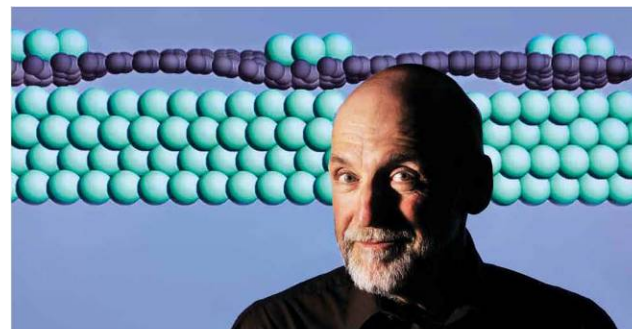
# Internal Publications



## Something to Think About...

**Energy:** Replacing six incandescent light bulbs in high-use areas in your home with comparable Energy Star® compact fluorescent light bulbs, which use up to 75 % less energy and last up to ten times longer, can reduce your overall annual electric consumption by more than 4 percent.

→ **Energy Management Program**



RESEARCHER PETER FREILANDER stands before his computational simulation suggesting an explanation for why rhenium atoms (colored green) nest regularly atop a base of graphene (dark-colored atoms) grown over an indium substrate. Graphene has proven a difficult material for researchers to tame and Peter's image of the orderly nanoscopic arrangement may provide insights to other scientists. His paper on the work was published last Thursday in *Physical Review B* online. Lead Nat'l Security story on page 4. (Photo by Randy Montoya)

## Tethered to the past

When Ed Boyne was a boy, he and his dad built and raced radio-controlled cars. Boyne's dad, a physicist, had a knack for building things that buzz around a track at 100 mph. Decades later, going through his father's estate, Ed found a set of tools that even resembled him to his nephew and to the girl's father gave him. Read the story on page 12.

## What's different in Sandia's HBE clinics?

By John Graham

If you visit one of Sandia's Health, Benefits, and Employee Services (HBE) clinics next week, the name will take your blood pressure. One always. Your physician will ask you whether you are allergic to any medications. One always. And that emergency room table paper will be there for you to sit on. One always.

So what's missing? Your medical chart. Beginning Friday, April 25, Sandia's clinics are a growing number of health clinics worldwide in replacing paper health records with electronic health records (EHR). From now on, your physician will reference your medical chart on a computer screen rather than flip through charts kept in a filing cabinet.

## Accuracy and automation

The change to electronic health records comes with important benefits. For one, any medication your physician prescribes will be submitted electronically to your pharmacy. Saved prescriptions not only give physicians a bed

(Continued on page 4)



## The physics of carbon nanotubes

François Léonard writes the book on subject

By Peter Koning

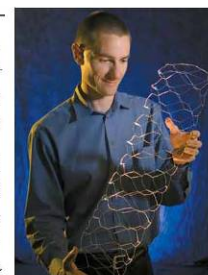
Carbon nanotubes, described as the original reality of the advanced materials world, are all the rage. Recently researchers at Rice University and Princeton Polytechnic Institute used them to make the "blackest black" — the darkest known material, reflecting only 0.45 percent of all light shined on it. Sandia is, naturally, in on the carbon nanotube game, with research led by physicist François Léonard (SF70). François has considerable experience in the subject, so much so that he wrote the book on it — literally, the title of a forthcoming work, *Physics of Carbon Nanotubes*, which could become the definitive text on the topic.

François says he had a thought of authoring a book on carbon nanotubes until he was approached by publishers, a result of a review article he wrote. "I was intrigued," he says. "It seems like there is a need for a book like this to explain this physics behind the applications."

Carbon nanotubes are long thin cylinders composed entirely of carbon atoms. While their diameters are in the nanometer range (0-10), they can be very long, up to centimeters in length. The carbon carbon bond is very strong, making carbon nanotubes very robust and resistant to any kind of deformation.

"Carbon nanotubes have very intriguing properties, both from a scientific perspective and for applications," says François.

(Continued on page 5)



FRANÇOIS LÉONARD uses carbon atoms to demonstrate how the carbon atoms arrange themselves into a nanotube. (Photo by Randy Montoya)

Augustine at Sandia	
Former Lockheed Martin CEO	
Mark Augustine, in a recent visit to Sandia, spelled out his ideas for "reengineering engineering education." He offered U.S. attributes of engineering education needed for 21st-century challenges. Story on page 6.	

Inside . . .	
Lab Director's Awards	2
Protein purification process	3
AAAS meeting in Albuquerque	4
Developing fuel for railway aircraft	6
Sandia Tiger Team advise Solar America Cible	8
Sandia Science and Technology Park gets grant	9

Hunter in Washington	
Labs Director Tom Hunter was part of an NNSA delegation that went to Capitol Hill to discuss the FY08 nuclear weapons budget with members of the Senate Energy and Water Appropriations Subcommittee. Story on page 9.	

## Other Communication Tools



- LTES Program Line 505-284-9883

- Electronic Trailers



- Windmasters



# Outreach Challenges

- It's **hard** to fill up an auditorium!
- In a sea of stuff, how do you make your stuff

**STAND OUT?**

- Public concerns about Sandia's legacy waste.



Workforce attendance at an EMS Lecture Series event

# Outreach *Success Story*

**“Get Rid of It” website awareness campaign –  
March 2008**

http://www-im.sandia.gov/getridofit/.'" data-bbox="225 375 742 892"/>

*Yikes! Now I've done it. I should have gone to the "Get Rid of It" website for proper handling of explosive materials.*

**get**  
Rid of It

The Get Rid of It website provides useful information for the disposition of materials from around Sandia. Just visit <http://www-im.sandia.gov/getridofit/>.

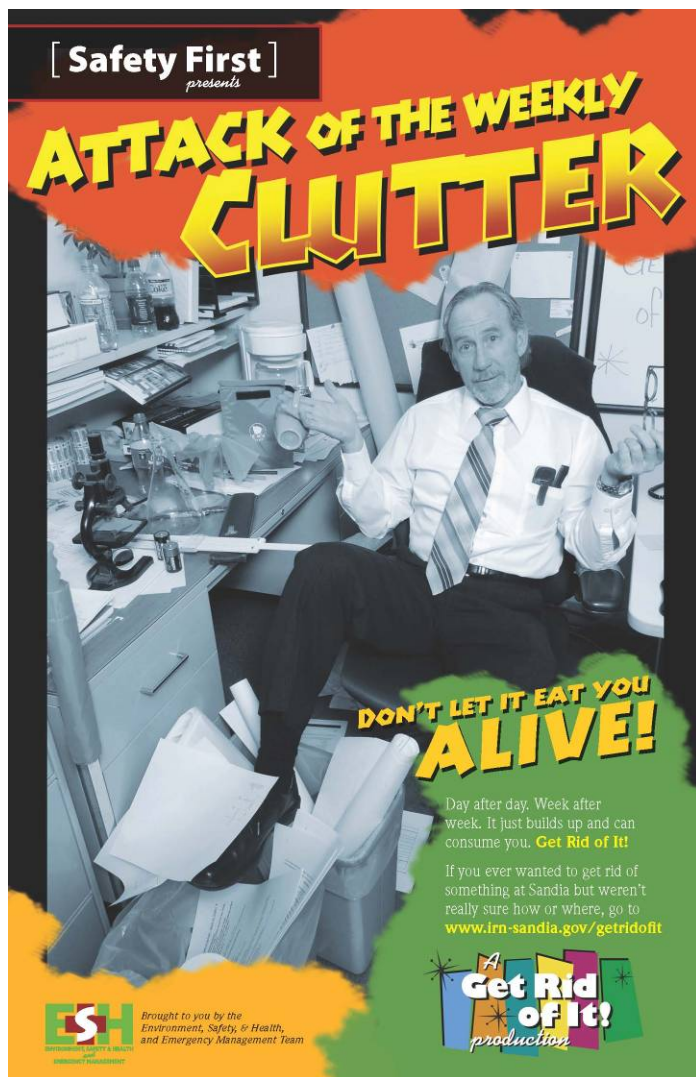


# Get Rid of It Awareness Campaign



- What is the Get Rid of It website?
- Marketing: Table Toppers, Safety First, Daily News Blurbs

# Get Rid of It Awareness Campaign



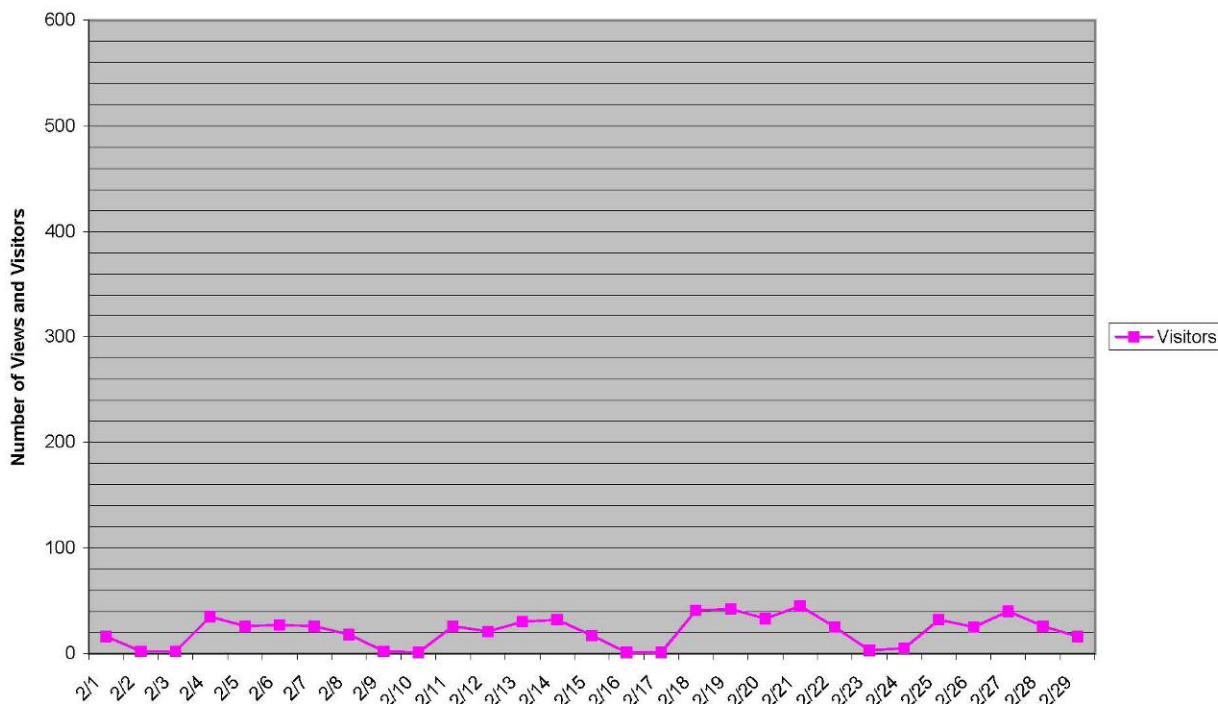
Safety First Posters –  
posted lab wide

What was the result of all  
of this  
**advertising?**



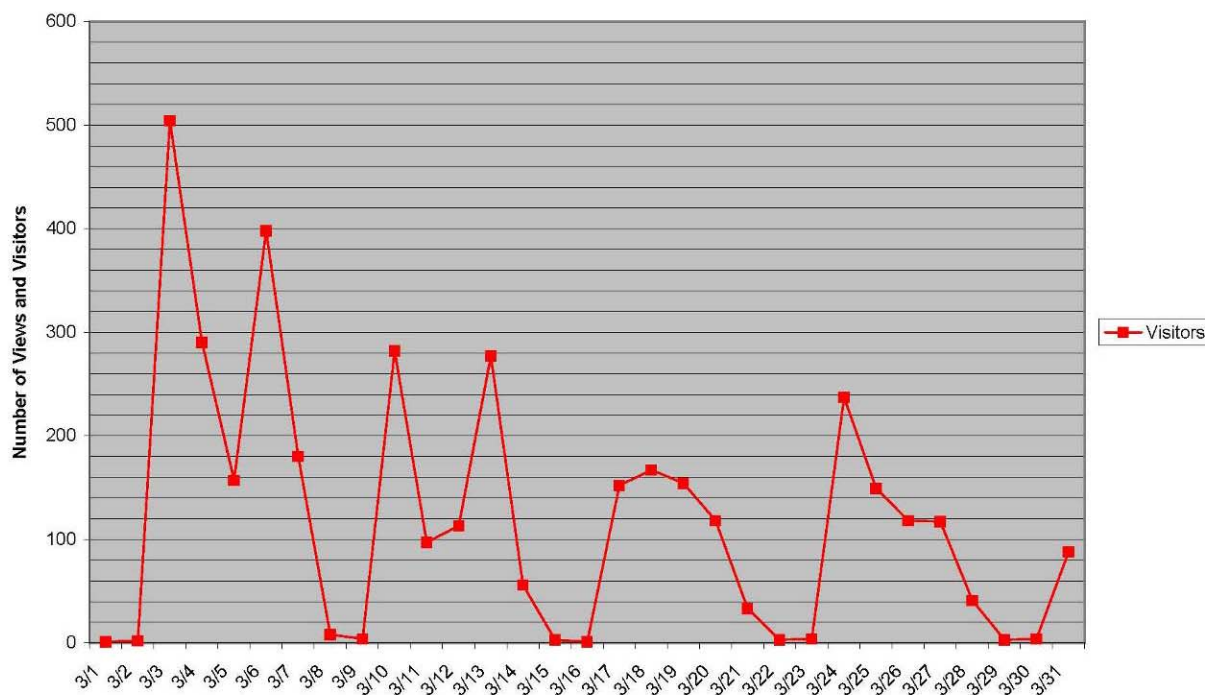
# Get Rid of It Awareness Campaign

## DAILY VISITORS TO SITE THE MONTH BEFORE CAMPAIGN



# Get Rid of It Awareness Campaign

## DAILY VISITORS TO THE SITE THE MONTH OF THE CAMPAIGN



## **Success Story – Tips!**

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- **Sandia Daily News weekly environmental tips often promote questions and comment**
- **One comment led to e-mail chain asking Sandia to stop the distribution of a hardcopy, glossy paper monthly publication.**
- **Result: Over 11,000 copies per month no longer printed. Publication can be read electronically!**

**Where should this little slide go??**

## **AWARDS**

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**2008 White House Closing the Circle Awards**

**Honorable Mentions**

**Environmental Management Systems – Civilian**

**Department of Energy**

**Sandia National Laboratories, Albuquerque, NM**

**Sandia EMS Team**

***EMS Implementation, Outreach, Program and  
Facilities Integration***

## Questions and sharing of IDEAS!

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**Please tell  
me what has  
worked for  
your  
Outreach  
Program!**

Thank you for your time!

Please feel free to contact me at [kmwagne@sandia.gov](mailto:kmwagne@sandia.gov)

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Members of the Environmental Management System Team